WATER RESOURCES ADVISORY COMMISSION ASR PRESENTATION
08/02/01

THE FEDERAL REGULATORY PERSPECTIVE:

THE PRIMARY PURPOSE OF THE ***FEDERAL SAFE DRINKING WATER ACT*** (SDWA) IS PUBLIC HEALTH PROTECTION. UNDER THAT ACT, PUBLIC HEALTH PROTECTION IS ACCOMPLISHED BY:

1. REGULATING THE QUALITY OF THE DRINKING WATER PRODUCED BY PUBLIC WATER SYSTEMSBI.E. THE PRIMARY DRINKING WATER STANDARDS (ALSO REFERRED TO AS THE MCL'S)B THE STATE HAS ALSO ADOPTED SECONDARY STANDARDS.

2. BY PROTECTION OF UNDERGROUND SOURCES OF DRINKING WATER (***USDW=S***)B A USDW IS ESSENTIALLY ANY ACLEAN@ GROUNDWATER WITH A TOTAL DISSOLVED SOLIDS CONCENTRATION OF 10,000 MG/L OR LESS.

THE AQUIFER STORAGE AND RECOVERY (**ASR**) PROGRAM IS PART OF THE UNDERGROUND INJECTION CONTROL (**UIC**) PROGRAM THAT IS AUTHORIZED UNDER THE FEDERAL SAFE DRINKING WATER ACT.

IMPLEMENTATION OF THE FEDERAL SAFE DRINKING WATER ACT AND THE UIC PROGRAM IS **DELEGATED** FROM EPA TO THE STATE OF FLORIDA (FDEP). IN ORDER TO MAINTAIN THAT DELEGATION, THE STATE SDWA AND THE STATE UIC REGULATIONS MUST BE AS STRINGENT AS THE FEDERAL REGULATIONS—THEY CAN ALSO BE MORE STRINGENT..

UNDER THE FEDERAL AND STATE REGULATIONS, ASR PROJECTS MAY BE PERMITTED ONLY IF THEY DO NOT AENDANGER@ THE PUBLIC HEALTHB **SEE ENDANGERMENT DEFINITION**

ENDANGERMENT DEFINITION FROM SECTION 1421 (D)(2) OF THE SDWA

UNDERGROUND INJECTION ENDANGERS DRINKING WATER SOURCES IF SUCH INJECTION MAY RESULT IN THE PRESENCE IN UNDERGROUND WATER, WHICH SUPPLIES OR CAN REASONABLY BE EXPECTED TO SUPPLY ANY PUBLIC WATER SYSTEM, OF ANY CONTAMINANT, AND IF THE PRESENCE OF SUCH CONTAMINANT MAY RESULT IN SUCH SYSTEM=S NOT COMPLYING WITH ANY NATIONAL PRIMARY DRINKING WATER REGULATION OR MAY OTHERWISE ADVERSELY AFFECT THE HEALTH OF PERSONS.

IN ORDER TO COMPLY WITH THIS ANO ENDANGERMENT@ REQUIREMENT, THE FEDERAL AND STATE OF FLORIDA REGULATIONS HAVE REQUIRED THAT THE WATER INJECTED AT ASR FACILITIES MEET ALL PRIMARY DRINKING WATER STANDARDS AT THE WELL HEAD.

IN CONSIDERATION OF THE POTENTIAL ENVIRONMENTAL BENEFITS AND COSTS SAVINGS IN SOLVING WATER USE PROBLEMS IN SOUTH FLORIDA, IN A FEBRUARY 1999 LETTER FROM JOHN HANKINSON TO SAM POOLE, EPA AGREED TO CONSIDER A RISKED BASED APPROACH TO THE USE OF RAW SURFACE AND GROUNDWATER FOR THE ASR WELLS PROPOSED AS PART OF THE RESTUDY.

THIS WAS HARD TO GET THE EPA ADMINISTRATION TO AGREE TO

THE LETTER STATES:

ABECAUSE OF THE IMPORTANCE OF IDENTIFYING EFFECTIVE WAYS TO STORE WATER IN THE REGION, EPA HAS INDICATED IN MEETINGS WITH INVOLVED STAKEHOLDERS THAT WE ARE WILLING TO CONSIDER A FLEXIBLE APPROACH TO CONSTRUCTING AND PERMITTING THE ASR WELLS PROPOSED BY THE RESTUDY. FOR THOSE WELLS, EPA BELIEVES THAT THE PROPOSED ARAW@ WATER ASR PROJECTS CAN BE IMPLEMENTED CONSISTENT WITH THE SDWA AND EPA=S REGULATIONS IF ARISK-BASED@ ANALYSES OF THE PROJECTS CAN DEMONSTRATE THAT THE USDW WILL NOT BE ENDANGERED IN A WAY THAT COULD ADVERSELY AFFECT THE HEALTH OF HUMANS. THIS APPROACH WOULD DEPEND ON A NUMBER OF FACTORS:

1.) THAT A MORE COMPREHENSIVE EVALUATION OF THE QUALITY OF THE PROPOSED SOURCE WATERS CONFIRMS THAT TOTAL COLIFORM BACTERIA IS THE ONLY PROBLEMATIC PARAMETER;

2.) THAT A DEMONSTRATION CAN BE MADE THAT THE BIOLOGICAL CONTAMINANTS WILL EXPERIENCE ADIE-OFF@ SUCH THAT THE PRESENCE OF THESE CONTAMINANTS IN THE USDW WILL NOT CAUSE A VIOLATION OF THE MCL OR POSE AN ADVERSE HEALTH RISK;

3.) THAT BOTH MODELING AND TEST MONITORING CONFIRM DIE-OFF AFTER INJECTION OF THE BIOLOGICAL CONTAMINANTS WITHIN A REASONABLE TIME-SPACE CONTINUUM AFTER INJECTION INTO A SALINE/BRACKISH AQUIFER;

4.) THAT THE USE OF ASR TECHNOLOGY ON THE SCALE AND WITH THE NUMBER OF WELLS PROPOSED, RESULTS IN RECOVERY OF A REASONABLE AMOUNT OF INJECTED WATERS AND OF REASONABLE QUALITY;

5.) THAT THERE ARE DOCUMENTED ENVIRONMENTAL BENEFITS TO BE DEPRIVED BY THE STORING OF WATER IN THE MANNER; AND

6.) THAT USE, AND TREATMENT, IF NECESSARY, OF THE RECOVERED WATER IS CONSISTENT WITH ITS INTENDED PRIMARY PURPOSE, I.E., FOR ECOSYSTEM RESTORATION.

DESK STATEMENT

EPA IS COMMITTED TO WORKING WITH THE STATE OF FLORIDA ON ITS EFFORTS TOWARDS THE DEVELOPMENT OF ARAW@ WATER ASR PROJECTS THAT ARE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT AND ARE BENEFICIAL TO THE STATE. WITH REGARDS TO THE PROPOSED ASR LEGISLATION, THE AGENCY DOES NOT TAKE A POSITION ON PENDING STATE LEGISLATION. HOWEVER, WHEN A STATE MODIFIES AN EPA DELEGATED PROGRAM, FOR EXAMPLE THROUGH A NEW LAW, THE STATE IS REQUIRED TO SUBMIT THE MODIFICATION FOR EPA=S REVIEW AND TO ENSURE THAT IR MEETS THE REQUIREMENTS FO FEDERAL REGULATIONS, THE SAFE DRINKING WATER ACT, IN THIS CASE.

BMENTION OTHER EPA CORRESPONDENCE/CONSISTENCY:

1. VARIANCE LETTER;

2. LETTER RECOMMENDING THAT THE CERP PILOT PROJECTS BE USED TO ANSWER ASR QUESTIONS;

TASK FORCE ISSUE TEAM RECOMMENDATIONS

IN SEPTEMBER 1998 THE SOUTH FLORIDA ECOSYSTEM RESTORATION WORKING GROUP FORMED THE AQUIFER STORAGE AND RECOVERY (ASR) ISSUE TEAM. THE TEAM WAS TASKED TO ASSESS ISSUES AND UNCERTAINTIES SURROUNDING THE LARGE-SCALE ASR IMPLEMENTATION AND DEVELOP AND ACTION PLAN TO ADDRESS THOSE ISSUES.

IN JULY 1999 THE ISSUE TEAM PRODUCED A REPORT, "AQUIFER STORAGE AND RECOVERY ISSUE TEAM ASSESSMENT AND COMPREHENSIVE STRATEGY". THE REPORT INCLUDED A PLAN RECOMMENDING PROJECTS AND/OR ACTIONS, WITH ASSOCIATED COSTS, TO EVALUATE THE FEASIBILITY OF ASR AS PROPOSED IN THE RESTUDY. THE REPORT ALSO LISTED SEVEN ISSUES SPECIFIC TO IMPLEMENTATION OF ASR WHICH NEED TO BE ADDRESSED:

ASR ISSUES

1.) CHARACTERIZATION OF THE QUALITY OF PROSPECTIVE SOURCE WATERS, SPATIAL AND TEMPORAL VARIABILITY

2.) CHARACTERIZATION OF REGIONAL HYDROGEOLOGY OF THE UPPER FLORIDAN AQUIFER: HYDRAULIC PROPERTIES AND WATER QUALITY

3.) ANALYSIS OF CRITICAL PRESSURE FOR ROCK FRACTURING.

4.) ANALYSIS OF SITE AND REGIONAL CHANGES IN HEAD AND PATTERNS OF FLOW

5.) ANALYSIS OF WATER QUALITY CHANGES DURING MOVEMENT AND STORAGE IN THE AQUIFER

6.) AQUIFER STORAGE AND RECOVERY POTENTIAL EFFECTS ON MERCURY BIOACCUMULATION FOR ECOSYSTEM RESTORATION PROJECTS

7.) RELATIONSHIP BETWEEN ASR STORAGE INTERVAL PROPERTIES AND RECOVERY RATES AND RECHARGE VOLUME

THE REPORT CONCLUDED THAT ASR IS APPLICABLE IN SOUTH FLORIDA BUT MORE INFORMATION IS NEEDED IN THE FOLLOWING AREAS:

1. **INFORMATION NEEDED TO VALIDATE REGIONAL SCALE APPLICATION**
2. **SOURCE WATER SUITABILITY WITH MINIMAL PRETREATMENT**
3. **HYDRAULIC RESPONSE TO LARGE SCALE RECHARGE**
4. **ASSESSMENT OF RECOVERED WATER FOR ENVIRONMENTAL COMPATIBILITY**
5. **DEMONSTRATION OF LARGE SCALE ASR WELLS CLOSELY CLUSTERED TO OBTAIN OPERATIONAL DATA.**

UPON COMPLETION OF THE REPORT BY THE ISSUE TEAM MANY OF THE ISSUES REMAIN. ASR IS A MAJOR WATER STORAGE COMPONENT IN THE COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP, PREVIOUSLY CALLED THE "RESTUDY"). THE PLAN WOULD USE OVER 300 ASR WELLS TO STORE 1.7 BILLION GALLONS PER DAY OF EXCESS WET PERIOD SURFACE WATER TO BE RETURNED AND USED DURING DRY PERIODS.

IN OCTOBER 19, 2000 THE COMMITTEE ON RESTORATION OF THE GREATER EVERGLADES ECOSYSTEM CROGEE) HELD AN ASR WORKSHOP IN MIAMI, FLORIDA. THE CROGEE PRODUCED A REPORT IN EARLY 2001, "AQUIFER STORAGE AND RECOVERY IN THE COMPREHENSIVE EVERGLADES RESTORATION PLAN. THE CROGEE GENERALLY CONCLUDED THAT AN IMPROVED UNDERSTANDING IN THREE AREAS OF UNCERTAINTY ARE NEEDED, **REGIONAL SCIENCE, WATER QUALITY, AND LOCAL FEASIBILITY**. ADDRESSING THESE AREAS WOULD REQUIRE STUDIES THAT WILL GO BEYOND THE SCOPE OF THE PROPOSED ASR PILOT STUDIES PROPOSED IN CERP.

IN GENERAL, THE CROGEE CONCOUDED THAT:

1. REGIONAL ANALYSIS OF THE SUBSURFACE IS CRUCIAL TO EVALUATIONG THE POTENTIAL FOR SUCCESS FOR CERP ASR COMPONENTS;

2. BIOGEOCHEMICAL REACTIONS IN THE SUBSURFACE AND THE POTENTIAL IMPACTS ON RECEIVING WATER BODIES AT THE SURFACE REQUIRE FURTHER INVESTIGATION AND UNDERSTANDING; AND

3. THOROUGH MONITORING AND TESTING AT PILOT PROJECT SITES ARE NECESSARY TO PROVIDE DATA TO THE REFERENCED REGIONAL AND WATER QUALITY INVESTIGATIONS.